

REMARKS

Reconsideration of the application is respectfully requested.

I. Status of the Claims

Claims 1 and 2 have been amended and the amendments do not add new matter.

Claims 1 and 2 are presently pending.

II. Rejections Under 35 U.S.C. § 112

Claims 1 and 2 are rejected under 35 U.S.C. § 112, second paragraph as indefinite. Applicants have amended the claims to remove the word “based” as per the Examiner’s helpful suggestion. Applicants submit that the claims are definite and request that the rejection be withdrawn.

III. Rejections under 35 U.S.C. § 102

The Examiner rejects claims 1 and 2 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,309,738 to Sakurai, under 35 U.S.C. § 102(b) as anticipated by Japanese Patent Publication JP 11-61380 to Kobe Steel, and under 35 U.S.C. § 102(b) as anticipated by Japanese Patent Publication JP 07-097679 to Sumitomo Electric. Applicants respectfully traverse the rejections.

Sakurai discloses a hard multi-layer coated tool in which individual (or distinctive) layers of TiNC and individual (or distinctive) layers of AlTiNC are alternately laminated.

Kobe Steel discloses a wear-resistant multi-layer coating in which individual (or distinctive) layers of TiAlN with low hardness, which contain relatively large amount of Al component and relatively small amount of Ti component, and individual (or distinctive) layers of TiAlN with high hardness, which contain relatively large amount of Ti component and relatively small amount of Al component, are alternately laminated.

Sumitomo Electric discloses a ultra thin multi-layer structure in which individual (or distinctive) layers of TiAlN, which contain relatively large amount of Al component and relatively small amount of Ti component, and individual (or distinctive) layers of TiAlN, which contain relatively large amount of Ti component and relatively small amount of Al component, are alternately laminated. As shown in FIG. 3 thereof, cutting inserts (substrates) 8 are mounted on the drum-shaped substrate carrier 7, and targets (TiN, AlN, TiAlN, etc.) are vaporized while being disposed in an opposing manner. Because the substrates 8 are mounted on and fixed to the surface of the substrate carrier 7, the vapor from a particular target (vapor source) is blocked by the substrate carrier 7 when one of the substrates 8 is located at a position opposite to the particular target. As a result of rotation of the substrate carrier 7, individual (or distinctive) layers are formed on the substrate 8.

In contrast to the technologies disclosed Sakurai, Kobe Steel and Sumitomo Electric, in the surface-coated cutting tool member according to claim 1, the hard coating layer has a component concentration profile in which maximum aluminum containing points (minimum titanium containing points) and minimum aluminum containing points (maximum titanium containing points) appear alternately and repeatedly at a predetermined interval in a direction of thickness of the hard coating layer, and the amount of contained aluminum (or titanium) is *continuously* changed

from the maximum aluminum containing points to the minimum aluminum containing points and from the minimum aluminum containing points to the maximum aluminum containing points. The hard coating layer does not have individual (or distinctive) layers. Because the structure of the coating is completely different from those disclosed in the prior art, the invention according to claim 1 is not anticipated by Sakurai, Kobe Steel and Sumitomo Electric. Due to such a structure of the hard coating layer, the cutting tool of the present invention exhibits superior high temperature properties, i.e., a superior wear resistance during a high speed cutting operation for various kinds of steels and cast irons, which could not be attained by the cutting tool according to Sakurai, Kobe Steel and Sumitomo Electric.

The same discussion also applies to the invention according to amended claim 2 which also claims that the concentration profile is "continuously changed." In the method according to claim 2, a hard coating layer having overall average thickness of 1 to 15 μm is formed, by a physical vapor deposition method, on the surface of the cutting tool being turned while rotating on the turntable about an axis of the cutting tool. In this case, the vapor from a particular target is *not* blocked by the turntable, and ions from the opposing targets are always mixed. As a result, the amount of contained Al component (or titanium component) is *continuously* changed, and individual (or distinctive) layers are *not* formed on the cutting tool substrate. Such features are not disclosed in Sumitomo Electric, in which the substrates 8 are fixed to the surface of the drum-shaped substrate carrier 7.

Thus, claims 1 and 2 are not taught or suggested by Sakurai, Kobe Steel, or Sumitomo Electric. Applicants respectfully request the rejection be withdrawn.

CONCLUSION

In view of the above amendments, Applicants believe the pending application is in condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

The Examiner is respectfully requested to contact the undersigned at the telephone number indicated below once he has reviewed the proposed amendment if the Examiner believes any issue can be resolved through either a Supplemental Response or an Examiner's Amendment.

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Respectfully submitted,

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